when the membrane was put in vibration. This tambour was connected in the usual way by an india-rubber tube with another similar one, upon which an ivory ball fell from a determined height. The intensity of the excitation of the nerve was modified by the jointed lever, which is supplied with the more modern models of Marey's apparatus. To excite the different parts of the same nerve, the tripod which supports the tambour travels along the table of the myographion.

The author examined by the graphic method the mode of movement of the lever, and found that in each experiment the lever strikes twice against the nerve, and that the last shock occupied a considerable space of time, but did not exert as profound an influence from above downward as the first.

The researches were directed to the modifications of irritability caused by a transverse section, and also the irritability of different portions of the same nerve. As regards the first of these, Hallsten has found that the changes in the irritability produced by a transverse cut may also be demonstrated by mechanical excitation. Concerning the irritability of different parts of the same nerve, his experiments show that it reaches its maximum a little below the point where the nerve trunk leaves the plexus, and diminishes on each side of this maximum point; the irritability is less, on the other hand, below the point where the femoral branch leaves, and from there it increases in both directions.

Finally, he shows also that even with mechanical excitation, an irritant that is about at its minimum produces a muscular contraction in a great range of the charge, and that these contractions diminish with the charge.

As to the determination of the exact degree of the minimum excitant, there exists, according to M. Hallsten, no difficulty in determining by his method the limits between which it is to be found; nevertheless he considers all determinations of this kind as illusory so long as these so-called limits for the calculation of the minimum excitant cannot be expressed in figures.

THE GANGLIA OF THE URINARY PASSAGES OF MAN AND CERTAIN ANIMALS.—The following are the conclusions of a recent memoir by Prof. Rudolf Maier, of Freiburg, published in *Virchow's Archiv*, lxxxv, 1 Hft., July, 1881.

1. Upon all portions of the walls of the urinary passages ex-

ternal to the kidneys, in man and certain other animals, are ganglia giving out nerve branches, and in the mucous as well as in the muscular layer.

2. In the mucous membrane they are situated either in its whole thickness or preferably or exclusively in that portion of it adjoining the muscular coats.

3. In the muscular coat itself the nerves form larger anastomoses between the coarser muscle bundles and smaller ones between the finer bundles of this greater layer. Both contain ganglia, the first the greater number.

4. The nervous plexuses in the muscular and mucous coats are in continuous connection with each other.

5. The nerve plexuses do not form a continuous closed network over the vessels, but more commonly form, by frequent anastomoses, connections between the more superficial and deeper layers.

6. The ganglia are situated :

a. On the nerve branches, and so arranged that the perineurium passes over them only on one side, while on the other the cell groups are margined directly by nerve fibres.

b. They lie, not closely associated with the nerve fibre, in rounded or spindle-shape masses, but in larger masses and more like a bunch of grapes on a stem, surrounded by connective tissue.

c. The ganglia lie in the middle of a nerve branch, and push the fibres apart from each other.

d. They are situated at the points of bifurcation of the nerve branches.

e. The ganglia lie embedded in the course of a single nerve fibre.

7. The ganglion cells, where they occur in large numbers together, are enclosed in a meshwork of perineurium.

8. Where they occur singly they are altogether or partly surrounded by a simple sheath of perineurium, or are naked ; they are enclosed in neurilemma when they appear within nerve fibres.

9. Part of the ganglion cells appear to be apolar, others are unipolar, and some again bipolar.

10. The processes divide themselves into true, that is, actual continuity of the protoplasm into a nerve fibre, and false, or extensions of the ganglionic sheath into the connective-tissue sheath of the nerves.

11. The ganglion-bearing nerve plexuses consist, for the most part, of pale fibres.